ESD-TR-67-226

TEST CORRELATES OF AIR FORCE WEATHER FORECASTER PROFICIENCY

Alan M. Kershner

March 1967

DECISION SCIENCES LABORATORY
ELECTRONIC SYSTEMS DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
L. G. Hanscom Field, Bedford, Massachusetts

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FOREWORD

The work reported here is part of the in-house research effort in support of Project 7682.

Special appreciation and thanks are due to the following:

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JAMES S. DUVA
Technical Director
Decision Sciences Laboratory

DONALD W. CONNOLLY
Project Officer
Decision Sciences Laboratory

Test Correlates of Air Force Weather Forecaster Proficiency

ABSTRACT

Results are presented from the administration of a battery of twenty-two tests to 76 Air Force weather forecasters who constituted criterion groups of "good" and "poor" forecasters selected by the use of the nominating technique. Five potential predictors were identified.

TABLE OF CONTENTS

I. INTRODUCTION*

This may be the concluding report in a research program designed to develop evaluation and selection instruments for Air Force weather forecasters. Previous reports have (a) described the overall program (5;7), (b) identified AF weather forecaster proficiency characteristics (4), (c) described the development of the criterion data and two evaluation instruments (5), and (d) determined significant differential education, training, experience and age characteristics between good and poor weather forecasters (6).

Reports of successful identification or development of predictor-tests for high level occupations are sparse. In addition to the problems of securing a large enough sample for which common criteria are applicable, there is the problem of securing cooperative subjects. The present study marks the second attempt to develop predictors for Air Force weather forecasters (3).

In the prior study in 1948 Jenkins secured data on the following variables: education, college major, mathematics background, forecasting and observing experience, kind of meteorological training, forecasting aids most frequently used, speed and accuracy of perception, spatial relations ability, general academic ability, and vocational interests. Information on the initially listed six variables was gathered by questionnaire. The last named four variables were measured, respectively, by the Minnesota Clerical Test, the Revised Minnesota Paper Form Board, the Ohio State University Psychological Test, and the Strong Vocational Interest Blank for Men.

* A condensation of this report was presented under the same title at the American Psychological Association meetings in Los Angeles in September 1964.

Jenkins concluded that Air Force weather forecasters were a highly select group as to educational background, and as to their clerical*, spatial relations, and general academic abilities. Only the Names section of the Minnesota Clerical Test proved to be a consistent predictor of forecasting skill with a correlation of .31. Whereas Jenkins' findings depended on correlations with a short-range forecast verification score as the criterion, the results developed in this study are based upon criterion ratings by colleagues who worked with ratees as a forecaster for over three months. The analyses culminating in the reports referenced above, in conjunction with Jenkins' findings, gave rise to the following decisions:

1. Another attempt to find test correlates of weather forecasting proficiency was warranted because of the high quality of the criterion data in the present study. Evidence for the reliability of the criterion ratings was indicated by the finding that only 4% of over 22,000 ratings, applicable to 1695 officer forecasters, were contradictory (5, p.5 & 6). Evidence for the validity of the ratings was found in the number and kinds of the biographical characteristics for which significant differences were found between both "good" (high criterion) and "poor" (low criterion) officer weather forecasters and "good" and "poor" enlisted forecasters (6).

2. Tests of a high order of difficulty should be employed in consideration of the number of mean scores found by Jenkins to fall at very high percentiles.

*It is believed more appropriate to speak of this ability as speed and accuracy of perception.

3. Tests of greater pertinence to the abilities required of weather forecasters were needed - with special attention to spatial relations. It was believed that the proficiency characteristics already identified (4) provided added clues for the selection of a trial test battery.

4 Verification of the criticality of perceptual speed and accuracy as found by Jenkins with the Names section of the Minnesota Clerical Test should be sought.

II. Procedure

A. Selection of Trial Test Battery

To implement the aims set forth above, a variety of Armed Forces tests were reviewed and one public and three private test development organizations were consulted. Because of his concentration on the study of high-level aptitudes, Professor Guilford was consulted and through him assistance was obtained from Dr. Philip R. Merrifield, who had experience in weather forecasting. Initially 26 tests were included in the trial battery which took 2 days to administer; however four tests were dropped from the battery in the early stages which reduced testing time to a day and a half. Tests for which a complete set of data were secured are listed in Table I; nineteen of them are shown by major classification in Guilford and Merrifield's "The Structure of Intellect Model: Its Uses and Implications", April 1960, where brief descriptions of those so classified can be found (1). Tests dropped from the battery are listed with accompanying reasoning in Appendix C.

Other tests included in the trial battery were, the Minnesota Clerical Test, DuBois and Gleser's Object-aperture Test, and items requiring cube matching from the U. S. Civil Service Commission (courtesy of

Ernest J. Primoff). For each test item the Object-aperture test shows a different three-dimensional object which is accompanied with five different two-dimensional apertures or openings. The subject's task is to select the opening through which the three-dimensional object could pass. The test has no specified time limit. The Civil Service Cubes Test consisted of twenty items which presented subjects with two separate cubes; one face of one cube contained two holes whereas one face of the other had two pegs; also presented were four ways in which the two cubes had been joined. Three faces, which included either holes or pegs, of the single cubes were shown whereas only two faces of one of the combined cubes and three of the other were shown. Each cube face had a unique design. The subject's task was to select the proper combination which could be formed by joining the two separate cubes. Subjects were allowed 35 minutes for this task.

B. Selection of Subjects

The primary ground rules for the selection of subjects were the same as used in the selection of forecasters for the biographical analysis, namely: "possessed a proficiency index of 1.33 and above or .90 and below as developed from ratings of officers with whom they had worked as forecasters" (6)*. Second, was geographic and travel fund availability. Many subjects volunteered - more were secured by command.

*Proficiency indices were developed by scoring two points for an above average rating, one point for an average rating, no points for a below average rating and dividing the total points by the number of ratings. Added criteria for inclusion in the present study were that six ratings be available for each subject and that no subject be included in the low criterion group who was not judged below average at least twice. It should be understood that when words such as "forecasting proficiency" and the like are used in this report that their connotation is limited to ratings by colleagues.

In order to prevent informal labelling of the forecasters as to criterion status, a number of them who did not fall within either the high and low criterion groups specified above were also administered the complete trial test battery. High criterion N=39; Low criterion N=37.

The criterion status of each of the 76 officers who composed the high and low criterion groups is presented with their test scores in Appendix A. The subjects ranged in rank from captain through full colonel with ten warrant officers included within the groups; and the approximate age range was between 39 and 47.

C. Test Administration

Tests were administered to groups as large as twelve and to single individuals. The administration of every test to every subject was directly supervised and monitored. The data were obtained from July 1961 to December 1963.

TABLE I

	MEAN		P	Std. Dev.		
COGNITION (9)	High	Low	(χ^2)	High	Low	SCORING
Competitive Planning	17.4	16.2		5.6	6.2	R - 1/2W + 3
G-Z General Reasoning	17.5	16.1	< .15	4.4	4.0	R - 1/4W
Pertinent Questions	26.3	24.0	< .01	3.4	4.1	R
Ship Destination	40.3	36.2	< .001	3.7	5.2	R + 1/5NA
Similarities	30.7	29.2		5.6	5.2	R
G-Z Spatial Orientation	24.0	25.3		9.1	8.8	R - 1/4W
G-Z Spatial Visualization (13')	23.5	22.2		7.1	8.0	R - 1/4W
G-Z Verbal Comprehension	53.1	46.9		8.6	13.2	R - 1/4W
Word Matrix	12.1	10.5	< .03	2.4	3.3	R - 1/5W + 3
DIVERGENT PRODUCTION (2)						
Match Problems II	11.3	10.6		3.9	3.5	R
Match Problems III	6.6	5.8		3.4	3.3	R
CONVERGENT PRODUCTION (5)						
Associations III	16.8	16.2		4.7	5.9	R
Correlate Completion II	31.2	25.5	< .001	6.3	8.2	R
Gestalt Transformation	13.1	11.8		2.7	2.9	R - 1/4W
Seeing Trends	18.4	17.1		5.8	6.5	R - 1/2W + 9
Word Group Naming	14.9	12.4	< .20	5.2	5.1	R - W + 1
EVALUATION (3)						
Logical Reasoning	27.6	25.1	< .15	5.9	6.5	R + 1/4NA
G-Z Perceptual Speed	43.2	40.4	< .15	8.8	8.3	R - W
Social Situations	13.5	12.8		2.5	3.1	R - 1/4W
Civil Service Cubes	7.8	7.8		3.8	3.9	R - 1/4W + 3
DuBois & Gleser's Object-Aperture	17.7	16.4		3.8	4.0	R
Minnesota Clerical Test: Numbers	126.1	120.4		24.6	26.4	R - W
Names	134.1	116.0	< .01	25.9	30.6	R - W

III. Discussion and Results

Table I presents the mean and standard deviation scores for the high and low criterion groups in conjunction with certain chi square probabilities and the formula by which each test was scored.

A. The Spatial Problem:

Before directing attention to the positive findings of this study it is appropriate to point out the lack of success in identifying a differential predictor for a spatial ability at a significant level. (The frequent lack of correspondence between parameters generated from verbal statements of job requirements and those generated by aptitude testing has plagued psychologists for a long time.) Because of the very considerable emphasis on the importance of spatial ability by forecasters themselves when analyzing the performance of the "best" and "poorest" forecaster with whom they had worked, special efforts were exerted to include a variety of spatial tests in the trial test battery. Not only do forecasters need to visualize weather in three dimensions but they must also contend with associated acceleration and deceleration trends. Five tests of a three dimensional spatial nature were included in the initial trial test battery and scores were obtained for all 76 officers on four of them.

Since spatial tests formed part of the test battery for the selection of air crew members during WW II, it was desirable to ascertain their representation within the two criterion groups. Twenty-two of the 37 members of the low criterion group were former air crew members (pilots, navigators, or bombardiers) whereas but 4 of the 39 members of the high

criterion group had such rated military air-crew experience. Accordingly, it is not surprising that the only two tests upon which average scores for the low criterion group equalled or exceeded high criterion scores were tests of spatial ability; specifically, Civil Service Cubes and G-Z Spatial Orientation respectively. The failure to find a significant difference between good and poor forecasters for one of the spatial ability tests may be attributable to greater preselection among the low criterion group on spatial ability. Hence, it is not appropriate to conclude that a spatial ability is not both germane and important for weather forecasting but merely that this particular study has not demonstrated its differential criticality. Even after an item analysis of the spatial ability tests, nothing promising emerged.

An examination of the scores made by the Air Force weather forecasters on the two dimensional Minnesota Paper Form Board reported by Jenkins, and their scores on the G-Z Spatial Orientation and G-Z Spatial Visualization in this study indicate that a spatial ability may be quite important for weather forecasting. It is for the aforementioned tests that normative data are available. Jenkins has reported as follows (3): "The mean score on the revised Minnesota Paper Form Board when compared to ... various male industrial groups falls from the 80th to the 97th percentile with a median value at the 90th percentile. Even compared to first and fifth year engineering students the percentile ranks are 80 and 70 respectively." In this study the mean score for the 76 forecasters on the Spatial Orientation was 24.6 which falls at about the 65th percentile when compared to G-Z norms for college men. For the Spatial Visualization

(Form B) scores for both 10 and 13 minutes were obtained. Table I and the appendix show only the scores for thirteen minutes. The mean score for all 76 weather forecasters for ten minutes was 19.1 which places at the 61st percentile on G-Z norms for college freshmen. It may be worth noting that on the G-Z Spatial Visualization that a difference of only .7 occurred between the high and low criterion groups for 10 minutes whereas there was a difference of 1.3 for 13 minutes. This suggests the possibility of generating greater variability by permitting more subjects to encounter more of the more difficult items embracing three rotations.

B. Positive Findings: Potential Predictors

Scrutiny of Table I discloses significant differences between the two criterion groups at the 3% level or better for five of the tests which were administered. Table II presents the correlations between nine of the tests and the biserial correlations between the tests and the criterion proficiency ratings. Biserial r for the predicted scores from a discriminant function analysis* was .59. Actually X_2 and X_3 alone can provide a multiple R within the criterion of .56.

It may be noted that, in terms of Guilford's "Structure of Intellect", three tests, namely, Ship Destination, Pertinent Questions, and Word Matrix are identified with Cognition which has been defined (1 p.5) as "discovery, awareness, rediscovery, or recognition of information in various forms; comprehension or understanding". More specifically, these tests are

*Performed at Arthur D. Little Inc. through the courtesy of Dr. Vincent E. Guiliano and by Mr. Joel E. Jensen; $y' = 2.554X_2 + .8983X_3 + 1.921X_5 + 1.701X_6 - 189$.

TABLE II

Correlations with Criterion and Intercorrelations of Selected Tests Employed in Trial AF Weather Forecaster Test Battery

		r Biserial X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
X_2	Ship Destination	.52								
X_3	Correlate Completion	.46	.54							
X_4	Minnesota Names	.38	.44	.61						
X_5	Pertinent Questions	.37	.35	.31	.29					
X_6	Word Matrix	.33	.32	.36	.28	.11				
X_7	Word Group Naming	.29	.31	.32	.38	.12	.22			
X_8	Logical Reasoning	.25	.36	.42	.14	.14	.25	.48		
X_9	General Reasoning	.20	.41	.41	.19	.04	.24	.28	.45	
X_{10}	Perceptual Speed	.20	.13	.30	.33	.17	.12	.30	.16	.04

identified respectively with the subcategories of General Reasoning, Conceptual Foresight and Semantic Relations.

The Correlate Completion II test is identified with the Structure of Intellect category Convergent Production. This is defined by Guilford and Merrifield as "generation of information from given information, where the emphasis is upon achieving unique or conventionally accepted or best outcomes" (1 p.5); the more specific subcategory represented by this test is Symbolic Correlates.

Although both this and Jenkins' study yielded significant findings for the Minnesota Names there is a considerable disparity between the overall mean of 145.8 which Jenkins reported and the overall mean of 125.3 found in this study. Every possible attempt has been made to seek some rational explanation of this difference but it has been impossible to secure identifying data for participants in the former study; the degree to which the test administrations were monitored in the former study is unknown; Jenkins has stated that tests were administered by the Air Weather Service (3); from his dissertation it appears from Appendix C that the test packages were mailed to the subjects themselves who were requested to secure their own monitors (2). When the differences between Jenkins high and low criterion groups and their standard deviations are compared with those of this study, the correspondence is considerably greater than exists for the mean values. For group one Jenkins found a difference of 16.2 between the upper and lower criterion groups with respective standard deviations of 22.1 and 37.6 (2 p.73); for group two the difference was 18.2 with respective standard deviations of 25.0 and 33.0 (2 p.99). Although the average age for the group in this

study was greater by approximately 14 years than for Jenkins' group, such an age difference would not seem to account for twenty and a half points in mean difference.

It is recommended that the tests found as potential predictors in this study be administered to recently qualified Air Force weather forecasters and to new forecasters being appointed in an effort to provide validating evidence for their operational use.

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APPENDIX A

TEST RESULTS

SCORES OF HIGH CRITERION AIR FORCE WEATHER FORECASTERS

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x
1.	1.45	19	11	22	2	12	15	27	9	6	108	94	20	52	26	8	37	25	14	18	12	36	19	7
2.	1.65	24	8	35	3	18	15	22	10	4	103	143	20	35	25	22	41	34	18	27	22	53	18	11
3.	1.65	19	25	34	10	22	14	34	8	8	179	196	14	57	26	20	39	28	14	12	25	66	22	14
4.	1.68	20	13	39	13	22	9	28	14	14	132	163	21	40	26	8	46	30	9	14	26	47	16	11
5.	1.56	14	19	29	10	19	11	22	14	7	110	89	20	32	22	9	40	35	12	22	25	41	15	12
6.	1.87	14	19	26	7	13	11	28	6	2	136	136	17	37	24	21	42	33	13	18	13	56	16	13
7.	1.50	21	23	38	4	26	14	28	10	4	130	148	14	48	27	22	42	25	13	26	32	58	13	11
8.	1.38	24	21	34	9	20	12	28	10	7	94	126	18	38	32	21	41	29	13	27	31	65	15	12
9.	1.66	16	22	28	10	20	9	28	5	5	110	114	17	46	28	22	40	31	12	14	32	56	13	13
10.	1.63	17	14	22	8	20	10	33	8	6	130	154	16	47	29	24	41	37	12	29	23	67	25	10
11.	1.79	17	17	32	8	9	12	23	7	1	144	130	15	40	24	10	32	27	10	12	23	52	13	11
12.	1.67	14	25	40	7	16	14	37	20	10	124	115	16	45	28	22	44	24	15	22	30	42	15	10
13.	1.83	18	17	28	6	21	17	23	9	7	100	126	20	43	20	21	38	29	15	21	21	56	5	18
14.	1.56	14	15	33	7	13	15	26	12	8	164	174	25	70	27	20	41	32	13	33	29	47	20	13
15.	1.54	3	21	35	5	16	17	30	11	7	109	147	18	29	30	27	43	31	14	40	32	65	9	8
16.	1.80	11	21	31	10	26	15	23	13	9	117	139	15	23	29	19	39	34	15	11	16	59	6	13
17.	1.60	16	23	27	7	21	12	31	12	6	85	112	24	44	21	15	40	29	15	11	20	51	9	17
18.	1.48	17	17	23	1	9	12	30	7	3	126	94	6	40	29	15	34	29	8	11	9	47	11	9
19.	1.49	16	30	36	8	18	17	24	10	4	153	155	16	43	30	22	42	29	15	10	28	52	15	14
20.	1.33	17	15	18	4	17	15	25	9	4	91	112	17	51	24	17	30	32	15	29	20	54	17	5
21.	1.43	9	18	34	8	16	9	22	8	3	85	97	19	37	30	17	44	33	15	24	24	37	7	13
22.	1.50	9	5	34	10	8	15	16	12	4	150	167	15	50	28	15	44	41	17	19	14	46	5	10
23.	1.60	18	14	38	15	21	9	31	17	9	145	167	17	43	26	20	44	38	14	43	35	61	21	13
24.	1.81	25	9	36	10	19	16	35	12	6	98	114	16	53	26	26	40	36	17	27	25	64	10	16
25.	1.70	20	21	31	3	18	16	20	17	10	145	128	20	47	20	25	41	36	15	35	10	55	13	14
26.	1.64	14	10	27	4	18	10	27	15	7	119	95	18	51	31	24	40	33	14	21	14	54	11	13
27.	1.73	19	21	11	11	10	13	25	5	4	118	111	18	44	21	10	36	30	12	32	24	47	13	10
28.	1.92	14	13	35	6	17	12	21	10	2	161	170	15	35	29	12	41	31	6	21	18	42	14	12
29.	1.95	19	20	29	6	20	16	37	14	9	.91	93	19	39	19	13	45	36	18	25	30	46	25	14
30.	1.55	10	14	24	4	14	12	17	12	8	119	130	13	43	31	21	33	28	11	24	15	48	11	10
31.	1.50	16	16	36	14	12	12	29	12	9	159	148	24	45	21	20	41	26	15	34	30	45	15	12
32.	1.83	13	19	37	4	16	10	30	13	4	163	155	16	44	29	25	41	34	12	15	28	57	19	13
33.	1.55	24	21	36	7	20	17	34	7	2	113	126	22	45	30	26	39	29	13	40	24	64	19	12
34.	1.64	17	13	37	8	17	8	26	13	14	145	170	22	42	25	23	45	30	13	34	24	60	24	11
35.	1.63	22	9	27	10	17	16	28	6	11	109	126	19	37	25	7	39	32	14	33	21	51	13	12
36.	2.00	15	24	33	15	17	12	33	22	7	144	146	18	44	29	14	45	29	16	38	31	46	19	12
37.	1.71	25	26	40	19	26	10	39	16	16.	146	148	23	58	30	27	47	37	14	28	39	68	23	14
38.	1.83	20	17	29	7	22	15	38	10	6	108	134	8	22	24	19	38	5	11	13	24	66	16	13
39.	1.88	16	11	31	4	16	15	19	14	4	158	138	21	44	26	9	38	30	13	23	18	44	11	14

LEGEND FOR APPENDIX A

a. Criterion Score

b. Associations III -- CNO5A

c. Competitive Planning

d. Correlation Completion

e. Civil Service Cubes

f. G-Z General Reasoning

g. Gestalt Transformation

h. Logical Reasoning

i. Match Problems II

j. Match Problems III

k. Minnesota Clerical - Numbers

l. Minnesota Clerical - Names

m. Object - Aperture

n. G-Z Perceptual Speed

o. Pertinent Questions

p. Seeing Trends

q. Ship Destination

r. Similarities

s. Social Situations

t. G-Z Spatial Orientation

u. G-Z Spatial Visualization

v. G-Z Verbal Comprehension

w. Word Group Naming

x. Word Matrix

SCORES OF LOW CRITERION AIR FORCE WEATHER FORECASTERS

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x
51.	.43	8	14	11	4	16	7	23	8	5	76	59	10	24	22	1	22	21	12	29	16	34	13	10
52.	.71	13	14	34	7	21	14	26	15	9	132	146	15	43	20	16	38	26	12	24	25	40	7	6
53.	.63	14	19	19	6	13	12	21	7	8	105	113	21	48	21	20	33	29	7	22	22	53	13	8
54.	.82	12	13	22	14	16	15	21	14	4	148	107	23	53	22	3	30	26	10	26	28	42	8	10
55.	.63	16	1	27	4	10	11	20	6	3	124	134	20	38	25	16	32	24	17	34	25	51	12	16
56.	.78	13	16	27	14	19	10	31	15	15	184	87	22	52	23	24	36	29	9	25	35	25	6	9
57.	.78	21	18	26	7	13	10	23	12	6	112	149	20	46	25	19	40	35	12	29	18	51	17	17
58.	.50	21	22	38	16	17	9	28	6	12	98	121	19	55	26	9	31	35	16	23	32	52	13	12
59.	.79	4	10	13	5	16	11	19	10	5	106	82	15	36	21	15	28	25	10	5	12	19	4	7
60.	.60	23	26	38	10	17	11	31	13	2	135	138	17	57	25	21	34	34	17	27	24	67	21	11
61.	.71	12	16	21	15	12	15	21	12	3	129	113	22	45	23	25	34	31	9	22	22	29	7	10
62.	.80	19	20	36	8	21	15	36	5	9	161	181	16	46	30	19	46	30	14	30	24	57	17	13
63.	.66	21	9	23	5	16	11	26	9	11	120	139	20	43	21	24	33	28	11	33	12	57	18	11
64.	.86	15	20	29	6	10	11	26	13	8	142	138	17	45	23	12	26	34	18	16	18	55	13	12
65.	.72	21	21	17	9	20	14	34	18	11	96	94	17	44	28	26	40	33	9	37	31	71	21	14
66.	.50	17	25	25	5	12	11	32	6	4	178	129	11	44	30	19	38	36	17	24	14	56	11	10
67.	.85	22	21	36	11	22	10	29	16	7	134	145	17	32	28	20	37	22	14	28	20	53	20	13
68.	.82	10	18	26	10	22	15	27	9	3	115	105	14	28	22	13	41	31	10	22	17	27	3	8
69.	.80	12	25	24	4	23	13	33	14	3	96	114	20	36	25	18	43	32	13	29	27	48	16	12
70.	.71	22	18	34	6	14	12	30	9	8	137	150	17	31	22	13	33	28	7	22	30	53	15	11
71.	.84	10	15	27	6	21	6	23	14	5	106	116	14	34	20	9	38	24	10	22	23	40	8	10
72.	.83	13	13	23	7	19	16	26	9	1	114	117	13	28	16	19	34	26	17	8	18	62	15	14
73.	.72	5	11	23	7	10	15	19	14	6	119	120	18	38	26	20	37	30	17	27	14	44	11	13
74.	.60	22	11	28	6	15	11	8	15	4	137	161	7	48	29	20	39	33	15	40	27	49	9	10
75.	.71	9	17	24	12	11	10	27	8	3	83	73	16	33	27	3	39	29	15	25	15	27	1	13
76.	.50	15	3	17	5	10	11	18	7	3	86	99	13	37	28	23	35	30	17	21	9	46	10	7
77.	.55	14	23	22	5	15	9	26	9	1	116	102	11	41	25	14	31	29	12	17	9	37	7	1
78.	.25	7	11	18	10	13	10	20	14	8	92	82	18	28	22	16	36	24	9	16	21	39	13	7
79.	.83	19	19	22	6	17	15	21	11	3	95	79	19	38	10	13	37	19	11	31	33	32	15	7
80.	.50	14	9	2	3	8	5	12	3	2	108	99	11	30	25	20	37	26	14	25	7	44	5	5
81.	.83	27	8	21	5	15	17	32	7	2	97	66	10	35	24	23	36	42	14	24	20	68	11	17
82.	.79	25	20	37	17	14	10	23	11	9	139	132	18	54	22	23	38	33	15	26	30	53	13	13
83.	.75	23	24	33	7	20	16	24	8	5	144	158	14	44	32	27	46	42	17	26	30	65	18	14
84.	.76	21	16	33	3	19	10	27	10	7	73	61	14	35	27	20	36	29	12	11	22	44	16	7
85.	.82	15	29	31	15	17	15	33	12	7	143	108	25	48	29	7	45	30	12	51	37	35	17	10
86.	.90	18	12	19	5	19	10	15	10	4	117	102	15	36	23	21	38	26	13	16	15	39	17	11
87.	.74	26	14	39	5	21	15	39	14	9	158	174	18	44	21	23	44	21	11	41	39	72	18	11

APPENDIX B

Special Notes on the Testing

Test scores presented in Table I and Appendix I for the G-Z Spatial Visualization were obtained by allowing subjects 13 minutes rather than the 10 minutes prescribed in the instructions.

Test item #13 was omitted from the DuBois-Gleser Object-aperture Test Form B - hence, maximum possible score was 27 rather than 28.

Social Situations (EP03A) consisted of 23 items (216-238) - total time allowed subjects was 7½ minutes.

APPENDIX C

Four tests were discontinued from the original battery. An ETS architectural aptitude test designed to tap a spatial ability was deemed to require too much time for administration (40 minutes) in terms of the number of items subjects were able to complete. An ETS Picture Discrimination Test concerned with perceptual speed seemed to require a disproportinate time to record responses. The Seeing Problems test appeared difficult to score objectively and took too much time to score. The Expressional Fluency simply was not taken seriously by the Air Force Weather Forecasters.

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13 ABSTRACT

Results are presented from the administration of a battery of twenty-two tests to 76 Air Force weather forecasters who constituted criterion groups of "good" and "poor" forecasters selected by the use of the nominating technique. Five potential predictors were identified.

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